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(54) PARTING TOOL

(71) I, FRITZ ANGST, of Swiss Nationality, of Breitenmatt 1362, Oberdürnten, Switzerland, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a new and improved parting tool or cut-off tool of the type incorporating a cutting insert which is fixedly clamped in a holder.

With heretofore known parting tools of this general type the relatively narrow cutting inserts extend linearly and during the cutting operation cut a single continuous cutting or shaving out of the material. The resultant cut-out depression or groove is the same width as the cuttings. The cuttings or shavings therefore bind in the cut-out groove and due to friction at the side surfaces of the groove the pressure acting upon the cutting insert is increased, so that such encounters increased resistance. In order to be able to take-up this increased resistance the cutting insert and its carrier must possess a certain strength and therefore a certain minimum width. Furthermore, the cutting or shaving which occupies the full width of the cut-out groove or depression impedes entry of cooling agent at the cutting location and therefore limits the cutting efficiency.

Hence, it is a primary object of the present invention to provide an improved construction of parting tool which is not associated with the aforementioned drawbacks and limitations of the prior art.

Another object of the present invention relates to an improved construction of parting tool which is relatively simple in construction and design, economical to manufacture, and provides for an improved cutting action.

In accordance with the invention there is provided a parting tool comprising a holder provided with a cutting insert, said cutting insert having a cutting edge which is formed by a central portion and two side portions which are set back from the central portion for forming separate cuttings during the cutting operation.

[Price 33p]

As a result the cuttings can depart without hindrance from the cut groove or depression so that a decisive reduction in the pressure at the cutting insert can be realized. This pressure reduction enables the design of the cutting insert and its holder to be narrower than was heretofore the case, whereby material waste during cutting can be reduced, and thus, there can be realized a saving in material. Furthermore, with the inventive construction of parting tool the cooling agent can flow unhindered between the cuttings to the cutting location and such thus can be better cooled. Due to the more favourable flow of the cuttings or shavings wear of the pressure finger is extremely slight.

Preferably each of the side portions of the cutting insert is substantially less wide than the central portion as viewed in a direction at right angles to the longitudinal axis of the tool.

Furthermore, the cutting insert can be advantageously constructed as a reversible or turnable plate, at both ends of which there is provided a respective said cutting edge.

The invention will be better understood when consideration is given to the following detailed description of a preferred embodiment thereof, reference being made to the accompanying drawings wherein:—

Figure 1 is a side view of a parting tool with a cutting insert fixedly clamped in a holder;

Figure 2 is a top plan view of the arrangement of Figure 1;

Figure 3 is an end view of the arrangement of Figure 1;

Figure 4 is a plan view of one end of the cutting insert depicted in Figures 1 to 3; and

Figure 5 is an end view of the showing of Figure 4.

Describing now the drawings, the illustrated parting tool embodies a holder 1 which possesses at its front end a partially cylindrical milled-out recess or otherwise suitably cut-out portion 2, so that at one side of the holder 1 there is formed a narrow stable support wall 3 which is formed of

one piece or integrally with the holder 1. At the side opposite the support wall 3 the holder 1 is bevelled at location 4. The upper narrow side of the support wall 3 possesses a prismatic depression or recess into which enters and is guided therein the prismatic lower narrow side 6 (Figure 1) of a cutting insert 7. A pin 5 inserted into the holder 1 forms a rearward stop for the cutting insert 7. A pressure finger 9 which can be fixedly clamped by means of a screw 8 or equivalent at the holder 1 acts from above upon the cutting insert 7 and clamps such against the support wall 3 and thus fixedly retains such in position. The pressure finger 9 possesses a guide rib 10 which engages with an appropriate guide groove 11 of the holder 1.

Now as best seen by referring to Figures 1 and 2 the cutting insert 7 is constructed as a turntable or reversible plate in that it is provided with a cutting edge at both ends and after loosening the screw 8 and the pressure finger 9 can be removed and again attached in its turned position so that it is possible to selectively use the one or the other cutting edge. Since, as best seen by referring to Figures 1 and 2 the partially cylindrical recess or milled-out portion 2 is concentric with respect to the cutting edge of the cutting insert 7 it is possible to use the tool to cut-out a piece 16 from a shaft 17 having the depicted diameter.

The cutting insert 7 as depicted in Figures 4 and 5 consists of a central or middle portion 12 and two side portions 13 which are set back with respect thereto. By means of this particular construction of the cutting edge there is attained the result that during the cutting operation there are obtained three separate cuttings or shavings, and specifically the initial cut is made with the central portion 12 and the smoothing or finishing operation at both sides is undertaken by means of both side portions 13. Owing to the fact that the central portion 12 only can advance into the solid material by a distance corresponding to that to which the side portions 13 are set back, and the fact that it is rendered free or exposed by the side portions 13, there are produced straight, non-varying and clean cut surfaces.

Such a cutting operation does not produce the difficulty of wedging of the cuttings between the horizontal central portion 12 and the workpiece since the groove which is formed by this central portion is shallow and the cuttings can easily be led away from the workpiece. As a result the side walls of the groove are smooth and the life of the side edges 16 of the central portion 12 and of the central portion 12 itself is prolonged. When the parting tool penetrates deeper into

the workpiece, the side portions 13 come into operation, each producing a separate cutting. These side cuttings can be led away from the workpiece more easily, as they are narrower than the produced groove. Meanwhile, the central portion 12 continues to cut under the same favourable conditions as before. Consequently the side portions 13 and its side edges 14 are less prone to damage. The outer groove side walls become very smooth, and the service life is prolonged.

It can be said that the central portion 12 is the leading edge and the side portions 13 are the trailing edges. The first cut is made by the central portion 12, whereas the side portions 13 produce a subsequent finish. Thus, the life of the parting tool and the interval between sharpening of the cutting edges depends on the quality or the conditions of the side portions 13 and their edges 14. Since the central portion 12 does most of the work of removing the metal, its side edges 16 become blunt before the side edges 14. Despite this, the parting tool can still do the cutting with great precision, because the side edges 14 remain sharp.

As should be apparent owing to this construction of the cutting edges of the cutting insert 7 the most favourable angles are obtained. The cutting edge can be easily re-ground at the upper side a number of times, so that the cutting profile is retained.

Due to the fact that with the described exemplary embodiments of cutting edges there are produced two or more cuttings or shavings and therefore during cutting there only occur slight pressures, the cutting insert and its support portion can be constructed to be extremely narrow.

The cutting insert may be formed, for example, of high-speed steel, hard metal or metal carbide or other materials.

The holder can be constructed to be left-sided or right-sided.

WHAT I CLAIM IS:—

1. A parting tool comprising a holder provided with a cutting insert, said cutting insert having a cutting edge which is formed by a central portion and two side portions which are set back from the central portion for forming separate cuttings during the cutting operation.

2. A parting tool according to Claim 1 wherein each of said side portions is substantially less wide than the central portion as viewed in a direction at right angles to the longitudinal axis of the tool.

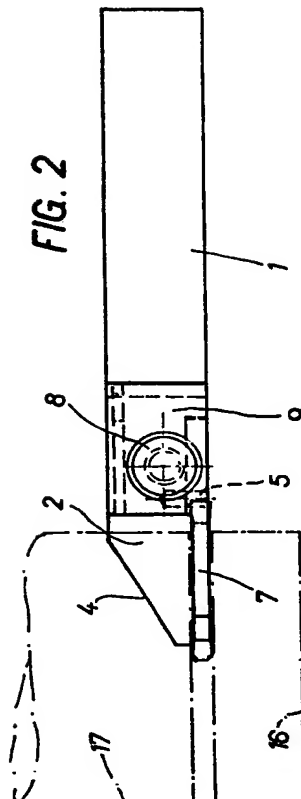
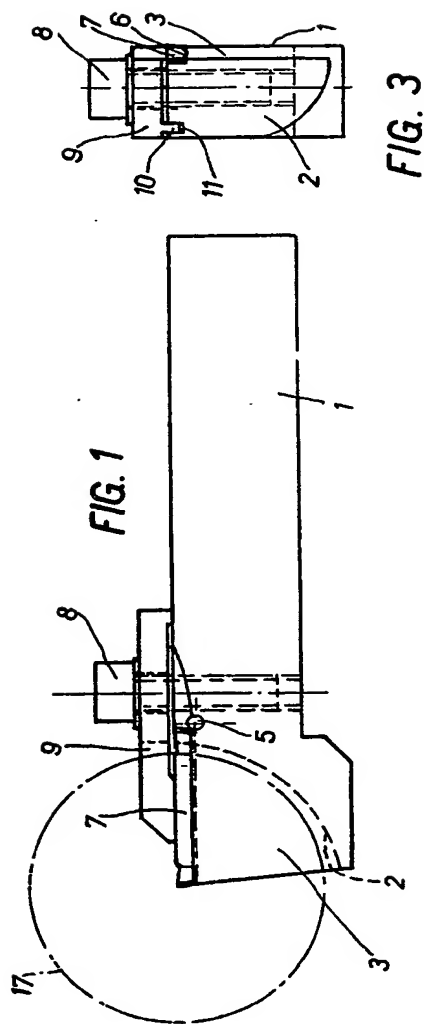
3. A parting tool according to Claim 1 or Claim 2, wherein the cutting insert comprises a turntable plate member having a

respective said cutting edge provided at
both ends thereof.

4. A parting tool substantially as herein-
before described with reference to the
5 accompanying drawings.

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Fig. 4

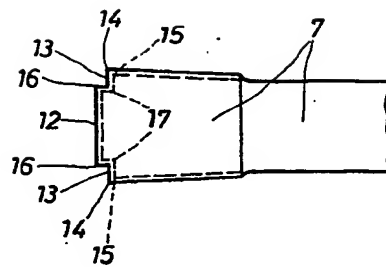


Fig. 5

